

The distinct *Typha angustifolia* (Typhaceae) ignored in Indian floras

Suman Halder, P. Venu^{1*} and Y.V. Rao²

Central National Herbarium, Botanical Survey of India, Howrah – 711 103, West Bengal, India.

¹Deccan Regional Centre, Botanical Survey of India, Hyderabad – 500 048, Andhra Pradesh, India.

²Department of Botany, Andhra University, Visakhapatnam – 530 003, Andhra Pradesh, India.

*E-mail: pvenu.bsi@gmail.com

Abstract

Typha angustifolia has been reported in a few Indian floras with quite inappropriate and mistaken interpretation and synonymy. The present communication reviews the materials at CAL and published floras and clarifies its identity and distribution in India.

Keywords: Flora, taxonomy, *Typha angustifolia*, *Typha angustata*, distribution

Introduction

The family Typhaceae is represented by a single genus *Typha* L. Its species are gregarious weeds in marshes and on the margins of shallow lotic systems particularly canals along agricultural fields and railway tracks throughout India. The genus is almost cosmopolitan in distribution, excluding the southern equatorial region of Africa (Bailey, 1963). Mabberley (2008) recognized 10-12 species all over the world. However three species, *T. angustata* Bory & Chaub., *T. angustifolia* L. and *T. domingensis* Pers. figure as accepted/synonyms/correct names and on which discussion is centered in the present communication. *Typha angustifolia* Willd. and *T. angustifolia* Kurz (non Linnaeus, 1756; = *T. angustata* Bory & Chaub.) have also appeared in literature (Roxburgh, 1832; Kurz, 1867). Four species were included in the Flora of British India (Hooker, 1893) under *Typha*, viz., *T. angustata* Bory & Chaub., *T. elephantina* Roxb., *T. javanica* Schnizl. and *T. laxmanii* Lepech. with notes under *T. angustata* stating that it closely resembles the European species, *T. angustifolia* L. Saha (1968) made an attempt to consolidate species in India and reported four species – *T. angustata*, *T. elephantina*, *T. latifolia* L. and *T. laxmanii*, the first two widespread throughout India while the other two restricted to Kashmir, Punjab, Deccan and probably Gujarat.

Persoon (1807) described *Typha domingensis* based on a West Indian material while Kunth (1815) described the same from South America under the

name *T. truxillensis*. Kronfeld (1889) and Graebner (1900) distinguished *T. domingensis* from *T. angustata* based on thickness of pistillate bracts/perigonial hairs which are essentially qualitative features. But this did not sustain and appropriately, Gèze (1912) and much later Smith (1967) have synonymised the latter under *T. domingensis* Pers. (*sensu amplo*). *Typha angustata* continued to appear in Indian floras in spite of its inclusion under *T. domingensis*. Apart, the distinctions between *T. angustifolia* and *T. domingensis* were well recognized (Boissier, 1884; Morong, 1888). Geze (*l.c.*) discussed in detail the differences among *T. angustifolia*, *T. domingensis* and *T. latifolia*. Cook (1980) in Flora Europaea, Fedchenko (1934) in Flora of the U.S.S.R. and Shu (2010) in Flora of China treated *T. angustifolia* and *T. domingensis* separately.

Despite this clarity having been established, *T. angustifolia* has been reported in a few Indian floras with quite inappropriate and mistaken interpretation and synonymy. *Typha angustata* (= *T. domingensis*), with distribution in Asia, northern Africa and southern Europe is often confused with *T. angustifolia*. The authors too have found that *T. angustifolia* as a definite entity with sizeable distribution in India. A review is made on the materials at CAL. In CAL, no specimens are kept under the *T. angustifolia* but the authors authenticated 7 specimens as *T. angustifolia* which are misidentified as *T. angustata*. These are included under specimens examined. The Indian floras

where discrepancies in identities are realized are also referred to under references.

The Enumeration of Monocotyledons by Karthikeyan *et al.* (1989) treated *T. angustata* under *T. angustifolia* perhaps following Backer (1948) in Flora Malesiana. This treatment continued in a few Indian floras—these include flora of Corbet National Park (Pant, 1986); the flora of Yavatmal district, Maharashtra (Karthikeyan & Kumar, 1993); the state flora of Maharashtra (Lakshminarasimhan, 1996) and the flora of Sanjay Gandhi National Park, Borivali, Mumbai (Pradhan *et al.*, 2005). In flora of Madhya Pradesh, the confusion was further added while treating both *T. domingensis* and *T. angustata* as synonyms of *T. angustifolia* (Mishra & Srivastava, 2001). Not so well understood morphology and specific identity of *T. angustifolia* has resulted in this mix-up.

Cook (1996) who reviewed Indian aquatics included only *T. domingensis* and *T. elephantina* and ignored reporting of *T. angustifolia*. But the species exists in India though as not as prevalent as *T. domingensis* (= *T. angustata*). The distinctions between the two taxa are given in table 1.

***Typha angustifolia* L.**, Sp. Pl. 2: 971. 1753; Backer in Steenis, Fl. Males. I, 4: 243. 1951 p.p. (excl. syn. *T. javanica*); H. Hara & Williams al. in Hara, Stearn & Williams, Enum. Fl. Pl. Nepal 87. 1978 p.p. (excl. syn.); Pant, Fl. Corbet National Park 159. 1986 p.p. (excl. syn. *T. angustata*); Karthikeyan *et al.*, Fl. Enum. Monocot. 288. 1989 p.p. (excl. syns. *T. domingensis* and *T. angustata*); O.P. Mishra *et al.*, Fl. Madhya Pradesh 3: 183. 2001 p.p. (excl. syns. *T. domingensis* and *T. angustata*); S.G. Pradhan *et al.*, Fl. Sanjay Gandhi National Park 623. 2005 p.p. (excl. syn. *T. angustata*); Karthikeyan & A. Kumar,

Fl. Yavatmal district 251. 1993 p.p. (excl. syn. *T. angustata*); Lakshminarasimhan in N.P. Singh & B.D. Sharma, Fl. Maharashtra (Monocot.) 3: 207. 1996 p.p. (excl. syn. *T. angustata*). **Fig. 1**

Perennial, rhizomatous, erect herbs, 1.5–3 m high. Stems unbranched, green, glaucous, terminating in an inflorescence. Leaves linear, flat or slightly convex on abaxial face; blades 4–12 mm wide when fresh, 3–8 mm when dry, sheathing at base, entire at margins, acute at apex; sheath membranous, auriculate at tip, often deciduous at maturity; mucilage glands present on adaxial face, usually from middle to tip of sheath, linear-oblong, brown; distal blades usually exceeding inflorescence. Flowering shoots 5–12 mm thick in middle and 2–3 mm thick near inflorescence. Inflorescence a long, cylindrical, compact, spike with staminate and pistillate flowers in separate aggregations, separated by 3 (0.6) – 8 (12) cm long interval of naked axis. Staminate spike not subtended by any bracts, 21–23 × 0.6–0.8 cm, relatively less dense, yellow; staminal filament half as long as anthers or smaller; anthers 2–5, slender, oblong, 2–2.5 × 0.2–0.3 mm, yellow, turn dark brown at apex when dried, twisted when old; bracts 3–5, filiform, 2–2.5 mm long, forked at apex, white when young, turn brown when dried; remnants of staminate bracts dry and fall off the spike leaving rachis bare after pollen release. Pistillate spike not subtended by any bracts, 21.5–23 × 0.5–0.6 cm; female flowers originate on peg-like 0.5–0.7 mm long compound pedicels; gynoeceum filiform, 0.8–1.5 mm long, borne on a carpodium; ovary fusiform, pale green, unilocular, small, with a single pendulous ovule; style slender, 0.3–0.4 × c. 0.1 mm long; stigma simple, as broad as style, erect, elongating, bending to form surface mat in flower; dark brown, deciduous in fruit; perigonal hairs linear,

Table 1. Comparison between *Typha domingensis* and *T. angustifolia*

Characters	<i>T. angustifolia</i> L.	<i>T. domingensis</i> Pers.
Leaf sheaths	Auriculate at tip	Taper into lamina
Brown spots on leaf surface	Present in the adaxial surface	Absent
Compound pedicels of female flowers	Slender with brown streaks	Dark brown and stumpy
Perigonal hairs of female flowers	Shorter and below stigma	As equal to stigma
Colour of Female flower bracts	Dark brown	Translucent
Staminate bracts	Forked at apex	Lacinate
Twisting of anthers	Twisted after dehiscence	Not twisted after dehiscence.



Fig. 1. *Typha angustifolia* L.: **a.** Herbarium specimen; **b.** Leaf sheath; **c.** Male flower; **d.** Staminate bract; **e.** Compound pedicels with single pedicel (inset); **f.** Female flower with bracts and perianth hairs; **g.** Pistillate bract; **h.** Gynoeceum; **i.** Follicle; **j.** Seed.

arising from carpopodium, remain below the stigma; pistillate bracts arise from carpopodium, slender, spatulate at tip, dark brown. Fruits minute follicles, fusiform, c. 1.2 mm long. Seed 1, pendulous, oblanceolate, 0.8–0.9 mm, orange-brown; a thin-walled pericarp surround the seed; surface vertically ribbed with papillae.

Distribution: A pantropical weed. In India, the species is distributed in Andhra Pradesh, Jharkhand, Himachal Pradesh, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Tamil Nadu, Uttar Pradesh and West Bengal.

Flowering & Fruiting: April – December.

Specimens examined: INDIA, **Andhra Pradesh**, Nellore district, without date, J.S. Gamble 12231. **Jharkhand**, Chotanagpur, 26.12.1993, S. Chandra 20940; East Singhbhum district, 23.04.2002, P. Chakrabarty 23554. **Himachal Pradesh**, Pongdam Catchment, 19.07.2001, S.K. Srivastava 97867. **Kerala**, West Hill Shore, 07.04.1972, T.A. Rao 9777. **Madhya Pradesh**, Barwani gage, 13.09.1957, G.S. Puri 26282. Indore district, 09.09.1964, C.R. Aron 50115. **Tamil Nadu**, Kanyakumari district, 07.12.1987, M.S. Swaminathan 68962; Salem district, 28.07.1977, R. Ansari 49950. **West Bengal**, Calcutta, 05.05.1996, Guha & Mondal 209 (CAL).

Acknowledgements

The authors thank the Director, Botanical Survey of India, Kolkata, for facilities and fellowship to one of them (SH) under Flora of India programme. The authors also thank Dr. V. Sampath Kumar, IBLO (Kew) for literature.

Literature Cited

- Backer, C.A. 1948.** Typhaceae. In: Steenis, C.G.G.J. van (Ed.), *Flora Malesiana*. Ser. I, Vol. 4(1). Noordhoff-Kolff, N.V., Batavia. pp. 242-244.
- Bailey, L.H. 1963.** *Manual of Cultivated Plants*. MacMillan, New York.
- Boissier, E. 1884.** *Flora Orientalis*. Vol. 5. A. Asher & Co., Amsterdam. pp. 49-51.
- Cook, C.D.K. 1980.** Typhaceae. In: Tutin, T.G., Heywood, V.H., Burges, N.A., Moore, D.M., Valentine, D.H., Walters, S.M. & D.A. Webb (Eds.), *Flora Europaea*. Vol. 5. Cambridge University Press, Cambridge. pp. 275-276.
- Cook, C.D.K. 1996.** *Aquatic and Wetland Plants of India*. Oxford University Press, New Delhi.
- Fedchenko, B.A. 1934.** Typhaceae. In: Komarov, V.L. (Ed.), *Flora of the U.S.S.R.* Vol. 1. Israel Program for Scientific Translations, Jerusalem. pp. 165-170.
- Gèze, J.B. 1912.** *Études botaniques et agronomiques sur les typha et quelques autres plantes palustres*. Villefranche-de-Rouergue: Société anonyme d'imprimerie. pp. 1-228.
- Graebner, P. 1900.** Typhaceae. In: Engler, H.G.A. (Ed.), *Das Pflanzenreich*. Vol. 4(8). Engelmann-Cramer, Weinheim. pp. 1-18.
- Hooker, J.D. 1893.** *The Flora of British India*. Vol. 6. L. Reeve & Co., London. pp. 488-489.
- Karthikeyan, S. & A. Kumar 1993.** *Flora Yavatmal District, Maharashtra*. Botanical Survey of India, Calcutta. p. 251.
- Karthikeyan, S., Jain, S.K., Nayar, M.P. & M. Sanjappa 1989.** *Florae Indicae Enumeratio: Monocotyledonae*. Botanical Survey of India, Calcutta. p. 288.
- Kronfeld, M. 1889.** Monographie der Gattung *Typha* Tourn. *Verhandl. Zool. Bot. Gesellschaft* 39: 89-192.
- Kunth, C.S. 1815.** Typhaceae. In: Humboldt, F.W.H.A., Bonpland, A.J.A. & C.S. Kunth (Eds.), *Nova genera et species Plantarum*. Vol. 1. Lutetiae Parisiorum: sumtibus Librariae Graeco-Latino-Germanico. p. 82.
- Kurz, S. 1867.** Revision of Indian Screw-pines and their allies. *J. Bot.* 5: 94-96.
- Lakshminarasimhan, P. 1996.** In: Singh, N.P. & B.D. Sharma (Eds.), *Flora of Maharashtra State – Monocotyledons*. Botanical Survey of India, Calcutta. p. 207.
- Mabberley, D.J. 2008.** *Mabberley's Plant-Book – A Portable Dictionary of Plants, their Classification and Uses*. Third edition. Cambridge University Press, Cambridge.
- Mishra, O.P. & S.K. Srivastava 2001.** Typhaceae. In: Singh, N.P., Khanna, K.K., Mudgal, & R.D. Dixit (Eds.), *Flora of Madhya Pradesh*. Vol. 3. Botanical Survey of India, Calcutta. p. 183.
- Morong, T. 1888.** Studies in the Typhaceae. *Bull. Torrey Bot. Club* 15: 1-8.
- Pant, P.C. 1986.** *Flora of Corbett National Park*. Botanical Survey of India, Calcutta. p. 159.

- Persoon, C.H. 1807.** *Synopsis Plantarum*. Vol. 2. Tubingae, apud J.G. Cottam. p. 532.
- Pradhan, S.G., Sharma, B.D. & N.P. Singh 2005.** *Flora of Sanjay Gandhi National Park, Borivali, Mumbai (Bombay)*. Botanical Survey of India, Calcutta. p. 623.
- Roxburgh, W. 1832.** *Flora Indica*. Vol. 3. W. Thaker & Co., Serampore, Calcutta. pp. 566-567.
- Saha, S. 1968.** The genus *Typha* in India — its distribution and uses. *Bull. Bot. Soc. Bengal* **22**: 11-18.
- Shu, X.P. 2010.** Typhaceae. In: Zhengyi, W., Raven, P.H. & H. Deyuan (Eds.), *Flora of China*. Vol. **23**. Science Press, Beijing & Missouri Botanical Garden Press, St. Louis. pp. 161-163.
- Smith, S.G. 1967.** Experimental and natural hybrids in North American *Typha* (Typhaceae). *Amer. Midl. Naturalist* **78**: 257-287.
-

Received: 12.02.2013

Revised and Accepted: 29.04.2014